

JAPANESE

[JP,09-331579,A]

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE  
INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

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[Translation done.]

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CLAIMS

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[Claim(s)]

[Claim 1] The program download approach to the migration terminal characterized by using the radio channel currently used by this call connection, and downloading a program to said migration terminal if the call connection demand to this migration terminal will be performed to the wireless exchange if modification of the program of a migration terminal is needed, and call connection is completed.

[Claim 2] Have the base transceiver station which communicates by two or more migration terminals and radio channels, and it has the wireless exchange and maintenance / employment pin center,large which were connected by said base transceiver station and circuit. Said wireless exchange and said maintenance / employment pin center,large are also connected by the circuit. Said maintenance / employment pin center,large Transmit the program of a migration terminal to said base transceiver station through a circuit, and said migration terminal is called through said wireless exchange and said base transceiver station. The program download approach to the migration terminal characterized by transmitting the program of this migration terminal to said migration terminal from said base transceiver station, and changing the program of this migration terminal.

[Claim 3] Have the base transceiver station which communicates by two or more migration terminals and radio channels, and it has the wireless exchange and maintenance / employment pin center,large which were connected by said base transceiver station and circuit. Said wireless exchange and said maintenance / employment pin center,large are also connected by the circuit. Said maintenance / employment pin center,large The program of a migration terminal is transmitted to said base transceiver station through a circuit. Said wireless exchange It is the program download approach to the migration terminal characterized by calling said migration terminal through said base transceiver station, and for said maintenance / employment pin center,large transmitting the program of this migration terminal to said migration terminal from said base transceiver station, and changing the program of this migration terminal.

[Claim 4] Said base transceiver station is the program download approach to a migration terminal given in either claim 2 characterized by receiving the program of said migration terminal from maintenance / employment pin center,large, holding in the storage section, and transmitting the program of this migration terminal to said migration terminal through said radio channel, or claim 3.

[Claim 5] It is the program download approach to the migration terminal according to claim 2 to 4 which said migration terminal has the program of this migration terminal on ROM, receives the program of this migration terminal from said base transceiver station through said radio channel, holds it in the storage section, and is characterized by to change into the program which held the program on said ROM in said storage section with the directions from said maintenance / employment pin center,large.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to the program download approach to the migration terminal which used the radio channel about the program download approach to a migration terminal.

[0002]

[Description of the Prior Art] Conventionally, as this kind of the program download approach, as shown, for example in JP,02-176954,A, a terminal unit and center equipment are connected by the communication line (cable), and the approach of downloading a program through that communication line is used.

[0003] Drawing 7 is the block diagram showing an example of the conventional program download approach. In this drawing, center equipment 16 is installed in the central management pin center, large as an example, and the terminal unit 17 is installed in the local maintenance center as an example. And center equipment 16 and a terminal unit 17 are connected by the communication line 18 (cable). This CPU20 is connected with center equipment 16 through the communication interface 19 including CPU20 which the terminal unit 17 equipped with memory 21. Moreover, CPU20 has the function which reads a program in a memory card 22, or is written in. Memory 21 has storage areas, such as various data and a program. The program of a terminal unit 17 is stored in the memory card 22 with the number of the program versions. The newest program of a terminal unit 17 is always set to center equipment 16.

[0004] If a power source is supplied to a terminal unit 17, CPU20 reads a program from memory card 22, and stores it in memory 21. The number of versions of this read program is transmitted to center equipment 16 from a terminal unit 17. The number of the program versions transmitted from the terminal unit 17 is compared with the newest number of the program versions memorized by this center equipment 16, center equipment 16 judges whether it is in agreement, and if not in agreement, it transmits the newest program to a terminal unit 17 through a communication line 18. In a terminal unit 17, the transmitted newest program is stored in memory 21, and the message which asks whether you may write the newest program in a memory card 22 is displayed. When the operator of a terminal unit 17 looks at this display and inputs the purport of authorization, it is memory card 22 HE writing \*\*\*\* about the newest program.

[0005] Although the approach mentioned above is the program download approach to a terminal unit 17, program download to migration terminals, such as a cellular phone, is also performed by the same approach as this. In this case, the terminal unit 17 was equivalent to the cellular phone (migration terminal), this migration terminal was brought to the maintenance center, and the program was changed by connecting this migration terminal to a communication line 18.

[0006]

[Problem(s) to be Solved by the Invention] In a Prior art, the 1st trouble is collecting migration terminals and changing a program, in order to change the program of a migration terminal. The reason is that ROM of a migration terminal was exchanged, or the external terminal of a migration terminal was connected to the communication line, and it had changed the program of

a migration terminal, in order to change the program of a migration terminal.

[0007] In a Prior art, the 2nd trouble is having connected program download equipment with the migration terminal with the cable, and having changed the program, and having to prepare two or more program download equipments (namely, equipment for connecting center equipment 16 and a migration terminal) according to this problem, in order to change the program of a migration terminal. The reason is that it is necessary to use two or more program download equipments, in order to change the program of two or more migration terminals at once, since the program of a migration terminal was changed using the external terminal of a migration terminal.

[0008] At this invention, in case the program of a migration terminal is changed, it aims at enabling program modification of a migration terminal, without collecting migration terminals, enabling program modification of a migration terminal without the external terminal of a migration terminal, and making possible program modification of two or more migration terminals to coincidence.

[0009]

[Means for Solving the Problem] Invention according to claim 1 will be characterized by using the radio channel currently used by this call connection, and downloading a program to said migration terminal, if the call connection demand to this migration terminal will be performed to the wireless exchange if modification of the program of a migration terminal is needed, and call connection is completed. Invention according to claim 2 has the base transceiver station which communicates by two or more migration terminals and radio channels. It has the wireless exchange and maintenance / employment pin center, large which were connected by said base transceiver station and circuit, and said wireless exchange and said maintenance / employment pin center, large are also connected by the circuit. Said maintenance / employment pin center, large The program of a migration terminal is transmitted to said base transceiver station through a circuit, said migration terminal is called through said wireless exchange and said base transceiver station, the program of this migration terminal is transmitted to said migration terminal from said base transceiver station, and it is characterized by changing the program of this migration terminal. Invention according to claim 3 has the base transceiver station which communicates by two or more migration terminals and radio channels. It has the wireless exchange and maintenance / employment pin center, large which were connected by said base transceiver station and circuit, and said wireless exchange and said maintenance / employment pin center, large are also connected by the circuit. Said maintenance / employment pin center, large The program of a migration terminal is transmitted to said base transceiver station through a circuit. Said wireless exchange Said migration terminal is called through said base transceiver station, said maintenance / employment pin center, large transmits the program of this migration terminal to said migration terminal from said base transceiver station, and it is characterized by changing the program of this migration terminal. Said base transceiver station receives the program of said migration terminal from maintenance / employment pin center, large, and invention according to claim 4 holds it in the storage section, and is characterized by transmitting the program of this migration terminal to said migration terminal through said radio channel. It carries out that invention according to claim 5 has the program of this migration terminal on ROM, receives the program of this migration terminal from said base transceiver station through said radio channel, holds it in the storage section, and changes said migration terminal into the program which held the program on said ROM in said storage section with the directions from said maintenance / employment pin center, large as the description.

[0010]

[Embodiment of the Invention]

\*\*1. The program of an operation migration terminal is set only to maintenance / employment pin center, large. From said maintenance / employment pin center, large, the program of said migration terminal is transmitted to a base transceiver station, and it holds in the storage section of a base transceiver station. Said maintenance / employment pin center, large changes the program of a migration terminal by calling the migration terminal which changes a program through the wireless exchange and said base transceiver station, and performing said migration terminal HEPURO gram download from said base transceiver station.

[0011] \*\*2. Explain the 1st operation gestalt, next the gestalt of operation of this invention to a detail with reference to a drawing. When drawing 1 is referred to, the gestalt of operation of the 1st of this invention includes maintenance / employment pin center, large 1, the wireless exchange 5, a base transceiver station 7, and the migration terminal 11. Maintenance / employment pin center, large 1, the wireless exchange 5, and a base transceiver station 7 are connected by the control signal line 6, respectively, and, as for a base transceiver station 7 and the migration terminal 11, a communication link is performed using a radio channel 15. Maintenance / employment pin center, large 1 is equipped with the 1st program download processing section 2, call connection section 3, and announcement equipment 4. The base transceiver station 7 is equipped with the 2nd program download processing section 8, the 3rd program download processing section 9, and the storage section 10. The migration terminal 11 is equipped with the 4th program download processing section 12, the storage section 13, and ROM14.

[0012] In addition, the 1st program download processing section 2, the 2nd program download processing section 8, the 3rd program download processing section 9, and the 4th program download processing section 12 are all the processing circuits centering on CPU (central processing unit) as an example, and operate based on the flow chart shown in drawing 2 - drawing 5. Moreover, as for the storage section 10 and the storage section 13, RAM is used by each as an example.

[0013] If maintenance / employment pin center, large 1 has a program download demand to the migration terminal 11, by the 1st program download processing section 2 and the 2nd program download processing section 8 of a base transceiver station 7, the control signal line 6 between maintenance / employment pin center, large 1 and a base transceiver station 7 will be used for it, and it will write a program in the storage section 10 of a base transceiver station 7. Maintenance / employment pin center, large 1 calls the migration terminal 11 which downloads a program by the call connection section 3, and connects it to announcement equipment 4. Next, the 1st program download processing section 2, By the 3rd program download processing section 9 of a base transceiver station 7, and the 4th program download processing section 12 of the migration terminal 11, between a base transceiver station 7 and the migration terminal 11 If the radio channel 15 currently used by call connection is used, the program written in the storage section 10 of a base transceiver station 7 is written in the storage section 13 of the migration terminal 11 and it is normally written in the storage section 13, this program will be written in ROM14 of the migration terminal 11. Maintenance / employment pin center, large 1 releases the call connected to announcement equipment 4 in the call connection section 3, after the program download to the migration terminal 11 is completed.

[0014] Next, actuation of the gestalt of operation of this invention is explained to a detail with reference to drawing 1, drawing 2, drawing 3, drawing 4, and drawing 5.

[0015] (1) In of operation maintenance / employment pin center, large 1 of the 1st program download processing section 2, if a program download demand to the migration terminal 11 is inputted, the 1st program download processing section 2 will perform the following processings. If drawing 1 and drawing 2 are referred to and the 1st program download processing section 2 will receive a program download demand to the migration terminal 11 (step 101), the downloaded number of the program versions which reads the number of versions of the program downloaded to the migration terminal 11 (step 102), and carries out a base transceiver station 7 HEPURO gram download initiation demand (step 103) will be transmitted.

[0016] Next, if a reply signal is received from a base transceiver station 7 (step 104), based on this reply signal, program download of base transceiver station 7 HE judges the 1st program download processing section 2 in the need (step 105), if it is required (step 106), it will download a base transceiver station 7 HEPURO gram (step 107), and if it is required and there is (step 109), it will call the migration terminal 11 in the call connection section 3 (step 112). [ no ]

[0017] Next, if the download result of a program is received from a base transceiver station 7 (step 108), if the 1st program download processing section 2 judges whether it was normally downloadable (step 110) and is able to download it normally based on this download result (step 111), it will call the migration terminal 11 in the call connection section 3 (step 112), and if not

normally downloadable (step 113), it will end processing (step 121).

[0018] Next, if the 1st program download processing section 2 judges whether there is any response from the migration terminal 11 (step 114) and has a response (step 115), it will connect with the announcement equipment 4 for program download (step 116), and it will transmit a program download initiation demand to the migration terminal 11 to a base transceiver station 7 (step 117). Next, if the 1st program download processing section 2 receives a download result from a base transceiver station 7 (step 119), the release call of it will be carried out (step 120), and it will end processing (step 121).

[0019] (2) In the base transceiver station 7 of the 2nd program download processing section 8 of operation, if a program download initiation demand is received from maintenance / employment pin center, large 1, the 2nd program download processing section 8 will perform the following processings.

[0020] When drawing 1 and drawing 3 are referred to, the 2nd program download processing section 8 If a program download initiation demand is received (step 201) Read the number of the program versions from the storage section 10 (step 202), and it compares with the number of the program versions received by the program download initiation demand (step 203). If the number of the program versions is inharmonious (step 204), will transmit a reply signal to maintenance / employment pin center, large 1, and it will notify being downloaded (step 205). If the number of the program versions is in agreement (step 207), a reply signal is transmitted to maintenance / employment pin center, large 1, and download will notify an unnecessary thing (step 208) and will end processing (step 215).

[0021] Next, it will judge whether it downloaded normally (step 209), and if it is normal (step 210), the 2nd program download processing section 8 writes in the program by which the storage section 10 HEDAUN load was carried out (step 211), and if a program downloads from maintenance / employment pin center, large 1 (step 206), it will notify that a download result is normal in the maintenance / employment pin center, large 1 (step 212), and it will end processing (step 215). If it does not download normally (step 213), a download result notifies that it was unusual to maintenance / employment pin center, large 1 (step 214), and processing is ended (step 215).

[0022] (3) In the base transceiver station 7 of the 3rd program download processing section 9 of operation, if the program download initiation demand to the migration terminal 11 from maintenance / employment pin center, large 1 is received, the 3rd program download processing section 9 will perform the following processings.

[0023] When drawing 1 and drawing 4 are referred to, the 3rd program download processing section 9 If a program download initiation demand to the migration terminal 11 is received (step 301) Check whether call connection of the migration terminal 11 is carried out (step 302), and if call connection is carried out (step 303) From the storage section 10, the number of the program versions is read (step 304), a migration terminal 11 HEPURO gram download initiation demand is transmitted by the radio channel 15 currently used by call connection (step 305), and the number of the program versions is notified. If call connection of the migration terminal 11 is not carried out (step 307), with a reply signal, a download result notifies that it was unusual to maintenance / employment pin center, large 1 (step 319), and carries out processing termination to it (step 320).

[0024] Next, the 3rd program download processing section 9 If a reply signal is received from the migration terminal 11 (step 306), program download will judge in the need from a reply signal (step 308). If required (step 309), the program currently written in the storage section 10 A migration terminal 11 HEDAUN load is carried out by the radio channel 15 currently used by call connection (step 310). If not required (step 312), to maintenance / employment sender 1, with a reply signal, a download result will notify that it was unusual (step 319), and will carry out processing termination (step 320).

[0025] Next, the 3rd program download processing section 9 If a download result is received from the migration terminal 11 (step 311) If it judges whether it downloaded to normal (step 313) and downloads normally from a download result (step 314), by the radio channel 15 currently used by call connection The program write-in directions to ROM14 are transmitted to the

migration terminal 11 (step 316). If it does not download normally (step 315), with a reply signal, a download result will notify that it was unusual to maintenance / employment pin center, large 1 (step 319), and will carry out processing termination to it (step 320).

[0026] Next, from the migration terminal 11, with a reply signal, a download result will notify that it was normal to maintenance / employment pin center, large 1 (step 318), and the 3rd program download processing section 9 will carry out processing termination to it, if the notice of write-in completion to ROM14 is received (step 317) (step 320).

[0027] (4) In the migration terminal 11 of the 4th program download processing section 12 of operation, if a program download initiation demand is received from a base transceiver station 7, the 4th program download processing section 12 will perform the following processings.

[0028] When drawing 1 and drawing 5 are referred to, the 4th program download processing section 12 If a program download initiation demand is received (step 401) The number of the program versions currently written to ROM14 is read (step 402). It compares with the number of the program versions received by the program download initiation demand (step 403). If the number of the program versions is inharmonious (step 404), will transmit a reply signal to a base transceiver station 7, and it will notify being downloaded (step 405). If a program is in agreement (step 407), a reply signal is transmitted to a base transceiver station 7, and download will notify an unnecessary thing (step 408) and will end processing (step 417).

[0029] Next, the 4th program download processing section 12 If a program downloads from a base transceiver station 7 (step 406) Judge whether it downloaded normally (step 409), and if normal (step 410) The program by which the storage section 13 HEDAUN load was carried out is written in (step 411). It notifies that a base transceiver station 7 HEDAUN load result is normal (step 412), and if not normal (step 416), a base transceiver station 7 HEDAUN load result will notify that it was unusual (step 417), and will end processing (step 418).

[0030] Next, if the program write-in directions to ROM14 are received from a base transceiver station 7 (step 413), the 4th program download processing section 12 will transmit the notice of write-in completion to ROM14 for the program written in the storage section 13 to ROM14 HE writing (step 414) and a base transceiver station 7 (step 415), and will end processing.

[0031] Next, the example of this invention is explained with reference to a drawing. Reference of drawing 1 makes the  $j$ -th edition the number of the program versions by which makes the  $i$ -th edition the number of the program versions memorized by the storage section 10 of ROM14 of the migration terminal 11, and a base transceiver station 7, for example, and program download is carried out from maintenance / employment pin center, large 1 in the example of this invention. If a program download demand to the migration terminal 11 is inputted in the maintenance / employment pin center, large 1, the 2nd program download processing section 8 HE of a base transceiver station 7 and a program download initiation demand will transmit from the 1st program download processing section 2 — having — the number of the program versions —  $=j$  edition is notified. The number of the program versions which has memorized the 2nd program download processing section 8 in the storage section 10 = since the  $i$ -th edition and the number of versions are inharmonious, it judges that download is required, a  $=j$  edition program is downloaded the number of base transceiver station 7 HEPURO gram editions as the 1st program download processing section 2 and the 2nd program download processing section 8, and it writes in the storage section 10.

[0032] Next, the migration terminal 11 is called in the call connection section 3, it connects with announcement equipment 4, and the 1st program download processing section 2 changes the migration terminal 11 into a call connection condition. Call connection is required of the wireless exchange 5 from the call connection section 3, call connection processing is performed by the wireless exchange 5, a base transceiver station 7, and the migration terminal 11, and it connects by the radio channel 15 between a base transceiver station 7 and the migration terminal 11. The 1st program download processing section 2 will transmit a program download initiation demand to the migration terminal 11 to the 3rd program download processing section 9 of a base transceiver station 7, if the migration terminal 11 will be in a call connection condition. The number of the program versions by which the 3rd program download processing section 9 used the radio channel 15 currently used by call connection to the 4th program download processing

section 12 of the migration terminal 11, transmitted the program download initiation demand to it, and was written in it at the storage section 10 = the  $j$ -th edition is notified. the number of the program versions the 4th program download processing section 12 is remembered to be by ROM — since  $=i$  edition and the number of versions are inharmonious, download is required — judging — the 3rd program download processing section 9 and the 4th program download processing section 12 — it is — the number of the migration terminal 11 HEPURO gram versions — a  $=j$  edition program is downloaded and it writes in ROM14. If the writing to ROM14 is completed, the 1st program download processing section 2 will release the call connected with the migration terminal 11.

[0033] Next, actuation of the example of this invention is explained to a detail with reference to drawing 1, drawing 2, drawing 3, drawing 4, and drawing 5.

(a) In of operation maintenance / employment pin center, large 1 of the 1st program download processing section 2, if a program download demand to the migration terminal 11 is inputted, the 1st program download processing section 2 will perform the following processings.

[0034] The number of the program versions which will read the program version number  $=j$  edition downloaded to the migration terminal 11 (step 102), and will carry out a base transceiver station 7 HEPURO gram download initiation demand (step 103) and which will be downloaded if drawing 1 and drawing 2 are referred to and the 1st program download processing section 2 will receive a program download demand to the migration terminal 11 (step 101) = the  $j$ -th edition is transmitted.

[0035] If a reply signal is received from a base transceiver station 7 (step 104), the 1st program download processing section 2 will be judged that the program download to a base transceiver station 7 from a reply signal is required (steps 105 and 106), and will download a base transceiver station 7 HEPURO gram (step 107). Next, if it is judged that the 1st program download processing section 2 was normally downloadable based on this download result when the download result of a program was received from the base transceiver station 7 (step 108) (steps 110 and 111), the migration terminal 11 will be called in the call connection section 3 (step 115).

[0036] Next, if the 1st program download processing section 2 has a response from the migration terminal 11 (steps 114 and 115), it will connect with the announcement equipment 4 for program download (step 116), and it will transmit a program download initiation demand to the migration terminal 11 to a base transceiver station 7 (step 116). Next, if the 1st program download processing section 2 receives the notice of the completion of program download from a base transceiver station 7 (step 117), the release call of it will be carried out (step 118), and it will end processing (step 119).

[0037] (b) In the base transceiver station 7 of the 2nd program download processing section 8 of operation, if a program download initiation demand is received from maintenance / employment pin center, large 1, the 2nd program download processing section 8 will perform the following processings.

[0038] The number of the program versions read the program version number  $=i$  edition (step 202), and received by the program download initiation demand from the storage section 10 when drawing 1 and drawing 3 were referred to and the 2nd program download processing section 8 received the program download initiation demand (step 201) = with the  $j$ -th edition, since it is inharmonious (steps 202 and 203), a reply signal is transmitted to maintenance / employment pin center, large 1, and it notifies being downloaded (step 205).

[0039] Next, the number of the program versions by which the storage section 10 HEDAUN load was carried out if it downloaded normally when the program downloaded the 2nd download processing section 8 from maintenance / employment pin center, large 1 (step 206) (steps 209 and 210) = the program of the  $j$ -th edition is written in (step 211), it notifies having downloaded normally to maintenance / employment pin center, large 1 (step 212), and processing is ended (step 215).

[0040] (c) In the base transceiver station 7 of the 3rd program download processing section 9 of operation, if the program download initiation demand to the migration terminal 11 from maintenance / employment pin center, large 1 is received, the 3rd program download processing

section 9 will perform the following processings.

[0041] When drawing 1 and drawing 4 are referred to, the 3rd program download processing section 9 If the program download initiation demand to 11 is received in the end of \*\*\*\*\* (step 301) Since call connection of the migration terminal 11 is carried out (steps 302 and 303) the storage section 10 — the number of the program versions — the radio channel 15 which reads =j edition (step 304) and is used by call connection — a migration terminal 11 HEPURO gram download initiation demand — transmitting (step 305) — the number of the program versions — =j edition is notified.

[0042] Next, if a reply signal is received from the migration terminal 11 (step 306), based on this reply signal, the 3rd program download processing section 9 will judge that program download is required (steps 308 and 309), and will download the program currently written in the storage section 10 to the migration terminal 11 by the radio channel 15 currently used by call connection (step 310).

[0043] Next, if a download result is received from the migration terminal 11 (step 311) and the 3rd program download processing section 9 will be downloaded from a download result to normal (steps 313 and 314), it will transmit the program write-in directions to ROM14 to the migration terminal 11 by the radio channel 15 currently used by call connection (step 316).

[0044] Next, from the migration terminal 11, if the notice of write-in completion to ROM14 is received (step 317), the 3rd program download processing section 9 will notify the completion of program download to maintenance / employment pin center,large 1 with a reply signal (step 318), and will end processing (step 319).

[0045] (d) In the migration terminal 11 of the 4th program download processing section 12 of operation, if a program download initiation demand is received from a base transceiver station 7, the 4th program download processing section 12 will perform the following processings.

[0046] The number of the program versions which read the program version number =i edition currently written to ROM14 (step 402), and was received by the program download initiation demand when drawing 1 and drawing 5 were referred to and the 4th program download processing section 12 received the program download initiation demand (step 401) = since the j-th edition and the number of the program versions are inharmonious (steps 403 and 404), it notifies that base-transceiver-station 7 HEPURO gram download is required (step 405).

[0047] Next, the number of the program versions downloaded if it downloaded normally when the program downloaded the 4th program download processing section 12 from the base transceiver station 7 (step 406) (steps 409 and 410) = it notifies that storage section 13 HE writing (step 411) and a base transceiver station 7 HEDAUN load were normal in the program of the j-th edition (step 412).

[0048] Next, the number of the program versions written in the storage section 13 when the 4th program download processing section 12 received the program write-in directions to ROM14 from the base transceiver station 7 (step 413) = the program of the j-th edition is written in ROM14 (step 414), it writes in a base transceiver station 7, the notice of completion is transmitted (step 415), and processing is ended (step 415).

[0049] \*\*3. Explain the 2nd operation gestalt, next the gestalt of operation of the 2nd of this invention with reference to a drawing. When drawing 6 is referred to, the gestalt of operation of the 2nd of this invention includes maintenance / employment pin center,large 1, the wireless exchange 5, a base transceiver station 7, and the migration terminal 11. Maintenance / employment pin center,large 1, the wireless exchange 5, and a base transceiver station 7 are connected by the control signal line 6, respectively, and, as for a base transceiver station 7 and the migration terminal 11, a communication link is performed using a radio channel 15.

Maintenance / employment pin center,large 1 is equipped with the 1st program download processing section 2. The wireless exchange 5 has the call connection section 3 and announcement equipment 4. The base transceiver station 7 is equipped with the 2nd program download processing section 8, the 3rd program download processing section 9, and the storage section 10. The migration terminal 11 is equipped with the 4th program download processing section 12, the storage section 13, and ROM14.

[0050] If maintenance / employment pin center,large 1 has a program download demand to the

migration terminal 11, by the 1st program download processing section 2 and the 2nd program download processing section 8 of a base transceiver station 7, the control signal line 6 between maintenance / employment pin center, large 1 and a base transceiver station 7 will be used for it, and it will write a program in the storage section 10 of a base transceiver station 7.

Maintenance / employment pin center, large 1 gives a call connection demand of the migration terminal 11 which downloads a program to the call connection section 3 of the wireless exchange 5. The wireless exchange 5 calls the migration terminal 11 in the call connection section 3, and connects with announcement equipment 4.

[0051] If call connection of the migration terminal 11 is carried out, maintenance / employment pin center, large 1 The 1st program download processing section 2, By the 3rd program download processing section 9 of a base transceiver station 7, and the 4th program download processing section 12 of the migration terminal 11 The radio channel 15 currently used by call connection between the base transceiver station 7 and the migration terminal 11 is used. If the program written in the storage section 10 of a base transceiver station 7 is written in the storage section 13 of the migration terminal 11 and it is normally written in the storage section 13, this program will be written in ROM14 of the migration terminal 11. Maintenance / employment pin center, large 1 requires a release call of the wireless exchange 5, after the program download to the migration terminal 11 is completed. The wireless exchange 5 releases the call connected to announcement equipment 4 in the call connection section 3.

[0052] Next, actuation of the gestalt of operation of the 2nd of this invention is explained to a detail with reference to a drawing. Since actuation of steps 101-111 of drawing 2, 113, 116, 117 and 119, drawing 3, and drawing 4 and drawing 5 is the same as that of the gestalt of the 1st operation, explanation is omitted. The call connection (step 112) of the migration terminal 11 of drawing 2 is required of the call connection section 3 of the wireless exchange 5. At the wireless exchange 5, if the migration terminal 11 is called in the call connection section 3, it will connect with the announcement equipment 4 for program download if there is a response from the migration terminal 11, and it notifies that call connection was carried out to maintenance / employment pin center, large 1 and there is no response, it will notify that call connection was not able to be carried out. In the maintenance / employment pin center, large 1, if call connection is carried out, a program download initiation demand to the migration terminal 11 is transmitted to a base transceiver station 7 (step 116), and if call connection is not carried out, processing will be ended (step 119).

[0053] Next, an example is explained. If the 1st program download processing section 2 of drawing 6 transmits a call connection demand of the migration terminal 11 to the wireless exchange 5, the wireless exchange 5 will call the migration terminal 11 in the call connection section 3, will connect with announcement equipment 4, will change the migration terminal 11 into a call connection condition, and will notify a call connection result to maintenance / employment pin center, large 1.

[0054] As mentioned above, although the operation gestalt of this invention has been explained in full detail with reference to a drawing, a concrete configuration is not restricted to this operation gestalt, and even if there is modification of a design of the range which does not deviate from the summary of this invention etc., it is included in this invention.

[0055]

[Effect of the Invention] When changing the program of a migration terminal, by downloading a program from maintenance / employment pin center, large, I hear that the 1st effectiveness can be changed and there is. It comes to be able to perform modification of a program thereby, without collecting migration terminals. The reason is that it can perform modification of a program by using the radio channel currently used by call connection, and downloading a migration terminal HEPURO gram.

[0056] When changing the program of a migration terminal, I hear that the 2nd effectiveness can download and change a program into two or more migration terminals at once, and there is. Thereby, the working hours which change the program of a migration terminal can be shortened now. The reason is that two or more migration terminals are called at once, and it can perform download of a program since a program can be changed by using the radio channel currently

used by call connection, and downloading a migration terminal HEPURO gram.

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[Translation done.]

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TECHNICAL FIELD

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[Field of the Invention] Especially this invention relates to the program download approach to the migration terminal which used the radio channel about the program download approach to a migration terminal.

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PRIOR ART

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[Description of the Prior Art] Conventionally, as this kind of the program download approach, as shown, for example in JP,02-176954,A, a terminal unit and center equipment are connected by the communication line (cable), and the approach of downloading a program through that communication line is used.

[0003] Drawing 7 is the block diagram showing an example of the conventional program download approach. In this drawing, center equipment 16 is installed in the central management pin center, large as an example, and the terminal unit 17 is installed in the local maintenance center as an example. And center equipment 16 and a terminal unit 17 are connected by the communication line 18 (cable). This CPU20 is connected with center equipment 16 through the communication interface 19 including CPU20 which the terminal unit 17 equipped with memory 21. Moreover, CPU20 has the function which reads a program in a memory card 22, or is written in. Memory 21 has storage areas, such as various data and a program. The program of a terminal unit 17 is stored in the memory card 22 with the number of the program versions. The newest program of a terminal unit 17 is always set to center equipment 16.

[0004] If a power source is supplied to a terminal unit 17, CPU20 reads a program from memory card 22, and stores it in memory 21. The number of versions of this read program is transmitted to center equipment 16 from a terminal unit 17. The number of the program versions transmitted from the terminal unit 17 is compared with the newest number of the program versions memorized by this center equipment 16, center equipment 16 judges whether it is in agreement, and if not in agreement, it transmits the newest program to a terminal unit 17 through a communication line 18. In a terminal unit 17, the transmitted newest program is stored in memory 21, and the message which asks whether you may write the newest program in a memory card 22 is displayed. When the operator of a terminal unit 17 looks at this display and inputs the purport of authorization, it is memory card 22 HE writing \*\*\*\* about the newest program.

[0005] Although the approach mentioned above is the program download approach to a terminal unit 17, program download to migration terminals, such as a cellular phone, is also performed by the same approach as this. In this case, the terminal unit 17 was equivalent to the cellular phone (migration terminal), this migration terminal was brought to the maintenance center, and the program was changed by connecting this migration terminal to a communication line 18.

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EFFECT OF THE INVENTION

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[Effect of the Invention] When changing the program of a migration terminal, by downloading a program from maintenance / employment pin center, large, I hear that the 1st effectiveness can be changed and there is. It comes to be able to perform modification of a program thereby, without collecting migration terminals. The reason is that it can perform modification of a program by using the radio channel currently used by call connection, and downloading a migration terminal HEPURO gram.

[0056] When changing the program of a migration terminal, I hear that the 2nd effectiveness can download and change a program into two or more migration terminals at once, and there is. Thereby, the working hours which change the program of a migration terminal can be shortened now. The reason is that two or more migration terminals are called at once, and it can perform download of a program since a program can be changed by using the radio channel currently used by call connection, and downloading a migration terminal HEPURO gram.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] In a Prior art, the 1st trouble is collecting migration terminals and changing a program, in order to change the program of a migration terminal. The reason is that ROM of a migration terminal was exchanged, or the external terminal of a migration terminal was connected to the communication line, and it had changed the program of a migration terminal, in order to change the program of a migration terminal.

[0007] In a Prior art, the 2nd trouble is having connected program download equipment with the migration terminal with the cable, and having changed the program, and having to prepare two or more program download equipments (namely, equipment for connecting center equipment 16 and a migration terminal) according to this problem, in order to change the program of a migration terminal. The reason is that it is necessary to use two or more program download equipments, in order to change the program of two or more migration terminals at once, since the program of a migration terminal was changed using the external terminal of a migration terminal.

[0008] At this invention, in case the program of a migration terminal is changed, it aims at enabling program modification of a migration terminal, without collecting migration terminals, enabling program modification of a migration terminal without the external terminal of a migration terminal, and making possible program modification of two or more migration terminals to coincidence.

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**MEANS**

[Means for Solving the Problem] Invention according to claim 1 will be characterized by using the radio channel currently used by this call connection, and downloading a program to said migration terminal, if the call connection demand to this migration terminal will be performed to the wireless exchange if modification of the program of a migration terminal is needed, and call connection is completed. Invention according to claim 2 has the base transceiver station which communicates by two or more migration terminals and radio channels. It has the wireless exchange and maintenance / employment pin center,large which were connected by said base transceiver station and circuit, and said wireless exchange and said maintenance / employment pin center,large are also connected by the circuit. Said maintenance / employment pin center,large The program of a migration terminal is transmitted to said base transceiver station through a circuit, said migration terminal is called through said wireless exchange and said base transceiver station, the program of this migration terminal is transmitted to said migration terminal from said base transceiver station, and it is characterized by changing the program of this migration terminal. Invention according to claim 3 has the base transceiver station which communicates by two or more migration terminals and radio channels. It has the wireless exchange and maintenance / employment pin center,large which were connected by said base transceiver station and circuit, and said wireless exchange and said maintenance / employment pin center,large are also connected by the circuit. Said maintenance / employment pin center,large The program of a migration terminal is transmitted to said base transceiver station through a circuit. Said wireless exchange Said migration terminal is called through said base transceiver station, said maintenance / employment pin center,large transmits the program of this migration terminal to said migration terminal from said base transceiver station, and it is characterized by changing the program of this migration terminal. Said base transceiver station receives the program of said migration terminal from maintenance / employment pin center,large, and invention according to claim 4 holds it in the storage section, and is characterized by transmitting the program of this migration terminal to said migration terminal through said radio channel. It carries out that invention according to claim 5 has the program of this migration terminal on ROM, receives the program of this migration terminal from said base transceiver station through said radio channel, holds it in the storage section, and changes said migration terminal into the program which held the program on said ROM in said storage section with the directions from said maintenance / employment pin center,large as the description.

[0010]

[Embodiment of the Invention]

\*\*1. The program of an operation migration terminal is set only to maintenance / employment pin center,large. From said maintenance / employment pin center,large, the program of said migration terminal is transmitted to a base transceiver station, and it holds in the storage section of a base transceiver station. Said maintenance / employment pin center,large changes the program of a migration terminal by calling the migration terminal which changes a program through the wireless exchange and said base transceiver station, and performing said migration terminal HEPURO gram download from said base transceiver station.

[0011] \*\*2. Explain the 1st operation gestalt, next the gestalt of operation of this invention to a

detail with reference to a drawing. When drawing 1 is referred to, the gestalt of operation of the 1st of this invention includes maintenance / employment pin center, large 1, the wireless exchange 5, a base transceiver station 7, and the migration terminal 11. Maintenance / employment pin center, large 1, the wireless exchange 5, and a base transceiver station 7 are connected by the control signal line 6, respectively, and, as for a base transceiver station 7 and the migration terminal 11, a communication link is performed using a radio channel 15.

Maintenance / employment pin center, large 1 is equipped with the 1st program download processing section 2, call connection section 3, and announcement equipment 4. The base transceiver station 7 is equipped with the 2nd program download processing section 8, the 3rd program download processing section 9, and the storage section 10. The migration terminal 11 is equipped with the 4th program download processing section 12, the storage section 13, and ROM14.

[0012] In addition, the 1st program download processing section 2, the 2nd program download processing section 8, the 3rd program download processing section 9, and the 4th program download processing section 12 are all the processing circuits centering on CPU (central processing unit) as an example, and operate based on the flow chart shown in drawing 2 - drawing 5. Moreover, as for the storage section 10 and the storage section 13, RAM is used by each as an example.

[0013] If maintenance / employment pin center, large 1 has a program download demand to the migration terminal 11, by the 1st program download processing section 2 and the 2nd program download processing section 8 of a base transceiver station 7, the control signal line 6 between maintenance / employment pin center, large 1 and a base transceiver station 7 will be used for it, and it will write a program in the storage section 10 of a base transceiver station 7.

Maintenance / employment pin center, large 1 calls the migration terminal 11 which downloads a program by the call connection section 3, and connects it to announcement equipment 4. Next, the 1st program download processing section 2, By the 3rd program download processing section 9 of a base transceiver station 7, and the 4th program download processing section 12 of the migration terminal 11, between a base transceiver station 7 and the migration terminal 11 If the radio channel 15 currently used by call connection is used, the program written in the storage section 10 of a base transceiver station 7 is written in the storage section 13 of the migration terminal 11 and it is normally written in the storage section 13, this program will be written in ROM14 of the migration terminal 11. Maintenance / employment pin center, large 1 releases the call connected to announcement equipment 4 in the call connection section 3, after the program download to the migration terminal 11 is completed.

[0014] Next, actuation of the gestalt of operation of this invention is explained to a detail with reference to drawing 1, drawing 2, drawing 3, drawing 4, and drawing 5.

[0015] (1) In of operation maintenance / employment pin center, large 1 of the 1st program download processing section 2, if a program download demand to the migration terminal 11 is inputted, the 1st program download processing section 2 will perform the following processings. If drawing 1 and drawing 2 are referred to and the 1st program download processing section 2 will receive a program download demand to the migration terminal 11 (step 101), the downloaded number of the program versions which reads the number of versions of the program downloaded to the migration terminal 11 (step 102), and carries out a base transceiver station 7 HEPURO gram download initiation demand (step 103) will be transmitted.

[0016] Next, if a reply signal is received from a base transceiver station 7 (step 104), based on this reply signal, program download of base transceiver station 7 HE judges the 1st program download processing section 2 in the need (step 105), if it is required (step 106), it will download a base transceiver station 7 HEPURO gram (step 107), and if it is required and there is (step 109), it will call the migration terminal 11 in the call connection section 3 (step 112). [ no ]

[0017] Next, if the download result of a program is received from a base transceiver station 7 (step 108), if the 1st program download processing section 2 judges whether it was normally downloadable (step 110) and is able to download it normally based on this download result (step 111), it will call the migration terminal 11 in the call connection section 3 (step 112), and if not normally downloadable (step 113), it will end processing (step 121).

[0018] Next, if the 1st program download processing section 2 judges whether there is any response from the migration terminal 11 (step 114) and has a response (step 115), it will connect with the announcement equipment 4 for program download (step 116), and it will transmit a program download initiation demand to the migration terminal 11 to a base transceiver station 7 (step 117). Next, if the 1st program download processing section 2 receives a download result from a base transceiver station 7 (step 119), the release call of it will be carried out (step 120), and it will end processing (step 121).

[0019] (2) In the base transceiver station 7 of the 2nd program download processing section 8 of operation, if a program download initiation demand is received from maintenance / employment pin center, large 1, the 2nd program download processing section 8 will perform the following processings.

[0020] When drawing 1 and drawing 3 are referred to, the 2nd program download processing section 8 If a program download initiation demand is received (step 201) Read the number of the program versions from the storage section 10 (step 202), and it compares with the number of the program versions received by the program download initiation demand (step 203). If the number of the program versions is inharmonious (step 204), will transmit a reply signal to maintenance / employment pin center, large 1, and it will notify being downloaded (step 205). If the number of the program versions is in agreement (step 207), a reply signal is transmitted to maintenance / employment pin center, large 1, and download will notify an unnecessary thing (step 208) and will end processing (step 215).

[0021] Next, it will judge whether it downloaded normally (step 209), and if it is normal (step 210), the 2nd program download processing section 8 writes in the program by which the storage section 10 HEDAUN load was carried out (step 211), and if a program downloads from maintenance / employment pin center, large 1 (step 206), it will notify that a download result is normal in the maintenance / employment pin center, large 1 (step 212), and it will end processing (step 215). If it does not download normally (step 213), a download result notifies that it was unusual to maintenance / employment pin center, large 1 (step 214), and processing is ended (step 215).

[0022] (3) In the base transceiver station 7 of the 3rd program download processing section 9 of operation, if the program download initiation demand to the migration terminal 11 from maintenance / employment pin center, large 1 is received, the 3rd program download processing section 9 will perform the following processings.

[0023] When drawing 1 and drawing 4 are referred to, the 3rd program download processing section 9 If a program download initiation demand to the migration terminal 11 is received (step 301) Check whether call connection of the migration terminal 11 is carried out (step 302), and if call connection is carried out (step 303) From the storage section 10, the number of the program versions is read (step 304), a migration terminal 11 HEPURO gram download initiation demand is transmitted by the radio channel 15 currently used by call connection (step 305), and the number of the program versions is notified. If call connection of the migration terminal 11 is not carried out (step 307), with a reply signal, a download result notifies that it was unusual to maintenance / employment pin center, large 1 (step 319), and carries out processing termination to it (step 320).

[0024] Next, the 3rd program download processing section 9 If a reply signal is received from the migration terminal 11 (step 306), program download will judge in the need from a reply signal (step 308). If required (step 309), the program currently written in the storage section 10 A migration terminal 11 HEDAUN load is carried out by the radio channel 15 currently used by call connection (step 310). If not required (step 312), to maintenance / employment sender 1, with a reply signal, a download result will notify that it was unusual (step 319), and will carry out processing termination (step 320).

[0025] Next, the 3rd program download processing section 9 If a download result is received from the migration terminal 11 (step 311) If it judges whether it downloaded to normal (step 313) and downloads normally from a download result (step 314), by the radio channel 15 currently used by call connection The program write-in directions to ROM14 are transmitted to the migration terminal 11 (step 316). If it does not download normally (step 315), with a reply signal, a

download result will notify that it was unusual to maintenance / employment pin center,large 1 (step 319), and will carry out processing termination to it (step 320).

[0026] Next, from the migration terminal 11, with a reply signal, a download result will notify that it was normal to maintenance / employment pin center,large 1 (step 318), and the 3rd program download processing section 9 will carry out processing termination to it, if the notice of write-in completion to ROM14 is received (step 317) (step 320).

[0027] (4) In the migration terminal 11 of the 4th program download processing section 12 of operation, if a program download initiation demand is received from a base transceiver station 7, the 4th program download processing section 12 will perform the following processings.

[0028] When drawing 1 and drawing 5 are referred to, the 4th program download processing section 12 If a program download initiation demand is received (step 401) The number of the program versions currently written to ROM14 is read (step 402). It compares with the number of the program versions received by the program download initiation demand (step 403). If the number of the program versions is inharmonious (step 404), will transmit a reply signal to a base transceiver station 7, and it will notify being downloaded (step 405). If a program is in agreement (step 407), a reply signal is transmitted to a base transceiver station 7, and download will notify an unnecessary thing (step 408) and will end processing (step 417).

[0029] Next, the 4th program download processing section 12 If a program downloads from a base transceiver station 7 (step 406) Judge whether it downloaded normally (step 409), and if normal (step 410) The program by which the storage section 13 HEDAUN load was carried out is written in (step 411). It notifies that a base transceiver station 7 HEDAUN load result is normal (step 412), and if not normal (step 416), a base transceiver station 7 HEDAUN load result will notify that it was unusual (step 417), and will end processing (step 418).

[0030] Next, if the program write-in directions to ROM14 are received from a base transceiver station 7 (step 413), the 4th program download processing section 12 will transmit the notice of write-in completion to ROM14 for the program written in the storage section 13 to ROM14 HE writing (step 414) and a base transceiver station 7 (step 415), and will end processing.

[0031] Next, the example of this invention is explained with reference to a drawing. Reference of drawing 1 makes the j-th edition the number of the program versions by which makes the i-th edition the number of the program versions memorized by the storage section 10 of ROM14 of the migration terminal 11, and a base transceiver station 7, for example, and program download is carried out from maintenance / employment pin center,large 1 in the example of this invention. if a program download demand to the migration terminal 11 is inputted in the maintenance / employment pin center,large 1, the 2nd program download processing section 8 HE of a base transceiver station 7 and a program download initiation demand will transmit from the 1st program download processing section 2 -- having -- the number of the program versions -- =j edition is notified. The number of the program versions which has memorized the 2nd program download processing section 8 in the storage section 10 = since the i-th edition and the number of versions are inharmonious, it judges that download is required, a =j edition program is downloaded the number of base transceiver station 7 HEPURO gram editions as the 1st program download processing section 2 and the 2nd program download processing section 8, and it writes in the storage section 10.

[0032] Next, the migration terminal 11 is called in the call connection section 3, it connects with announcement equipment 4, and the 1st program download processing section 2 changes the migration terminal 11 into a call connection condition. Call connection is required of the wireless exchange 5 from the call connection section 3, call connection processing is performed by the wireless exchange 5, a base transceiver station 7, and the migration terminal 11, and it connects by the radio channel 15 between a base transceiver station 7 and the migration terminal 11. The 1st program download processing section 2 will transmit a program download initiation demand to the migration terminal 11 to the 3rd program download processing section 9 of a base transceiver station 7, if the migration terminal 11 will be in a call connection condition. The number of the program versions by which the 3rd program download processing section 9 used the radio channel 15 currently used by call connection to the 4th program download processing section 12 of the migration terminal 11, transmitted the program download initiation demand to it,

and was written in it at the storage section 10 = the j-th edition is notified. the number of the program versions the 4th program download processing section 12 is remembered to be by ROM -- since =i edition and the number of versions are inharmonious, download is required -- judging -- the 3rd program download processing section 9 and the 4th program download processing section 12 -- it is -- the number of the migration terminal 11 HEPURO gram versions -- a =j edition program is downloaded and it writes in ROM14. If the writing to ROM14 is completed, the 1st program download processing section 2 will release the call connected with the migration terminal 11.

[0033] Next, actuation of the example of this invention is explained to a detail with reference to drawing 1 , drawing 2 , drawing 3 , drawing 4 , and drawing 5 .

(a) In of operation maintenance / employment pin center,large 1 of the 1st program download processing section 2, if a program download demand to the migration terminal 11 is inputted, the 1st program download processing section 2 will perform the following processings.

[0034] The number of the program versions which will read the program version number =j edition downloaded to the migration terminal 11 (step 102), and will carry out a base transceiver station 7 HEPURO gram download initiation demand (step 103) and which will be downloaded if drawing 1 and drawing 2 are referred to and the 1st program download processing section 2 will receive a program download demand to the migration terminal 11 (step 101) = the j-th edition is transmitted.

[0035] If a reply signal is received from a base transceiver station 7 (step 104), the 1st program download processing section 2 will be judged that the program download to a base transceiver station 7 from a reply signal is required (steps 105 and 106), and will download a base transceiver station 7 HEPURO gram (step 107). Next, if it is judged that the 1st program download processing section 2 was normally downloadable based on this download result when the download result of a program was received from the base transceiver station 7 (step 108) (steps 110 and 111), the migration terminal 11 will be called in the call connection section 3 (step 115).

[0036] Next, if the 1st program download processing section 2 has a response from the migration terminal 11 (steps 114 and 115), it will connect with the announcement equipment 4 for program download (step 116), and it will transmit a program download initiation demand to the migration terminal 11 to a base transceiver station 7 (step 116). Next, if the 1st program download processing section 2 receives the notice of the completion of program download from a base transceiver station 7 (step 117), the release call of it will be carried out (step 118), and it will end processing (step 119).

[0037] (b) In the base transceiver station 7 of the 2nd program download processing section 8 of operation, if a program download initiation demand is received from maintenance / employment pin center,large 1, the 2nd program download processing section 8 will perform the following processings.

[0038] The number of the program versions read the program version number =i edition (step 202), and received by the program download initiation demand from the storage section 10 when drawing 1 and drawing 3 were referred to and the 2nd program download processing section 8 received the program download initiation demand (step 201) = with the j-th edition, since it is inharmonious (steps 202 and 203), a reply signal is transmitted to maintenance / employment pin center,large 1, and it notifies being downloaded (step 205).

[0039] Next, the number of the program versions by which the storage section 10 HEDAUN load was carried out if it downloaded normally when the program downloaded the 2nd download processing section 8 from maintenance / employment pin center,large 1 (step 206) (steps 209 and 210) = the program of the j-th edition is written in (step 211), it notifies having downloaded normally to maintenance / employment pin center,large 1 (step 212), and processing is ended (step 215).

[0040] (c) In the base transceiver station 7 of the 3rd program download processing section 9 of operation, if the program download initiation demand to the migration terminal 11 from maintenance / employment pin center,large 1 is received, the 3rd program download processing section 9 will perform the following processings.

[0041] When drawing 1 and drawing 4 are referred to, the 3rd program download processing section 9 If the program download initiation demand to 11 is received in the end of \*\*\*\*\* (step 301) Since call connection of the migration terminal 11 is carried out (steps 302 and 303) the storage section 10 — the number of the program versions — the radio channel 15 which reads =j edition (step 304) and is used by call connection — a migration terminal 11 HEPURO gram download initiation demand — transmitting (step 305) — the number of the program versions — =j edition is notified.

[0042] Next, if a reply signal is received from the migration terminal 11 (step 306), based on this reply signal, the 3rd program download processing section 9 will judge that program download is required (steps 308 and 309), and will download the program currently written in the storage section 10 to the migration terminal 11 by the radio channel 15 currently used by call connection (step 310).

[0043] Next, if a download result is received from the migration terminal 11 (step 311) and the 3rd program download processing section 9 will be downloaded from a download result to normal (steps 313 and 314), it will transmit the program write-in directions to ROM14 to the migration terminal 11 by the radio channel 15 currently used by call connection (step 316).

[0044] Next, from the migration terminal 11, if the notice of write-in completion to ROM14 is received (step 317), the 3rd program download processing section 9 will notify the completion of program download to maintenance / employment pin center,large 1 with a reply signal (step 318), and will end processing (step 319).

[0045] (d) In the migration terminal 11 of the 4th program download processing section 12 of operation, if a program download initiation demand is received from a base transceiver station 7, the 4th program download processing section 12 will perform the following processings.

[0046] The number of the program versions which read the program version number =i edition currently written to ROM14 (step 402), and was received by the program download initiation demand when drawing 1 and drawing 5 were referred to and the 4th program download processing section 12 received the program download initiation demand (step 401) = since the j-th edition and the number of the program versions are inharmonious (steps 403 and 404), it notifies that base-transceiver-station 7 HEPURO gram download is required (step 405).

[0047] Next, the number of the program versions downloaded if it downloaded normally when the program downloaded the 4th program download processing section 12 from the base transceiver station 7 (step 406) (steps 409 and 410) = it notifies that storage section 13 HE writing (step 411) and a base transceiver station 7 HEDAUN load were normal in the program of the j-th edition (step 412).

[0048] Next, the number of the program versions written in the storage section 13 when the 4th program download processing section 12 received the program write-in directions to ROM14 from the base transceiver station 7 (step 413) = the program of the j-th edition is written in ROM14 (step 414), it writes in a base transceiver station 7, the notice of completion is transmitted (step 415), and processing is ended (step 415).

[0049] \*\*3. Explain the 2nd operation gestalt, next the gestalt of operation of the 2nd of this invention with reference to a drawing. When drawing 6 is referred to, the gestalt of operation of the 2nd of this invention includes maintenance / employment pin center,large 1, the wireless exchange 5, a base transceiver station 7, and the migration terminal 11. Maintenance / employment pin center,large 1, the wireless exchange 5, and a base transceiver station 7 are connected by the control signal line 6, respectively, and, as for a base transceiver station 7 and the migration terminal 11, a communication link is performed using a radio channel 15. Maintenance / employment pin center,large 1 is equipped with the 1st program download processing section 2. The wireless exchange 5 has the call connection section 3 and announcement equipment 4. The base transceiver station 7 is equipped with the 2nd program download processing section 8, the 3rd program download processing section 9, and the storage section 10. The migration terminal 11 is equipped with the 4th program download processing section 12, the storage section 13, and ROM14.

[0050] If maintenance / employment pin center,large 1 has a program download demand to the migration terminal 11, by the 1st program download processing section 2 and the 2nd program

download processing section 8 of a base transceiver station 7, the control signal line 6 between maintenance / employment pin center,large 1 and a base transceiver station 7 will be used for it, and it will write a program in the storage section 10 of a base transceiver station 7.

Maintenance / employment pin center,large 1 gives a call connection demand of the migration terminal 11 which downloads a program to the call connection section 3 of the wireless exchange 5. The wireless exchange 5 calls the migration terminal 11 in the call connection section 3, and connects with announcement equipment 4.

[0051] If call connection of the migration terminal 11 is carried out, maintenance / employment pin center,large 1 The 1st program download processing section 2, By the 3rd program download processing section 9 of a base transceiver station 7, and the 4th program download processing section 12 of the migration terminal 11 The radio channel 15 currently used by call connection between the base transceiver station 7 and the migration terminal 11 is used. If the program written in the storage section 10 of a base transceiver station 7 is written in the storage section 13 of the migration terminal 11 and it is normally written in the storage section 13, this program will be written in ROM14 of the migration terminal 11. Maintenance / employment pin center,large 1 requires a release call of the wireless exchange 5, after the program download to the migration terminal 11 is completed. The wireless exchange 5 releases the call connected to announcement equipment 4 in the call connection section 3.

[0052] Next, actuation of the gestalt of operation of the 2nd of this invention is explained to a detail with reference to a drawing. Since actuation of steps 101-111 of drawing 2 , 113, 116, 117 and 119, drawing 3 , and drawing 4 and drawing 5 is the same as that of the gestalt of the 1st operation, explanation is omitted. The call connection (step 112) of the migration terminal 11 of drawing 2 is required of the call connection section 3 of the wireless exchange 5. At the wireless exchange 5, if the migration terminal 11 is called in the call connection section 3, it will connect with the announcement equipment 4 for program download if there is a response from the migration terminal 11, and it notifies that call connection was carried out to maintenance / employment pin center,large 1 and there is no response, it will notify that call connection was not able to be carried out. In the maintenance / employment pin center,large 1, if call connection is carried out, a program download initiation demand to the migration terminal 11 is transmitted to a base transceiver station 7 (step 116), and if call connection is not carried out, processing will be ended (step 119).

[0053] Next, an example is explained. If the 1st program download processing section 2 of drawing 6 transmits a call connection demand of the migration terminal 11 to the wireless exchange 5, the wireless exchange 5 will call the migration terminal 11 in the call connection section 3, will connect with announcement equipment 4, will change the migration terminal 11 into a call connection condition, and will notify a call connection result to maintenance / employment pin center,large 1.

[0054] As mentioned above, although the operation gestalt of this invention has been explained in full detail with reference to a drawing, a concrete configuration is not restricted to this operation gestalt, and even if there is modification of a design of the range which does not deviate from the summary of this invention etc., it is included in this invention.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the gestalt of operation of the 1st of this invention.

[Drawing 2] It is a flow chart for explaining actuation of the 1st program download processing section 2 of drawing 1 .

[Drawing 3] It is a flow chart for explaining actuation of the 2nd program download processing section 8 of drawing 1 .

[Drawing 4] It is a flow chart for explaining actuation of the 3rd program download processing section 9 of drawing 1 .

[Drawing 5] It is a flow chart for explaining actuation of the 4th program download processing section 12 of drawing 1 .

[Drawing 6] It is the block diagram showing the gestalt of operation of the 2nd of this invention.

[Drawing 7] It is the block diagram showing the conventional example.

[Description of Notations]

- 1 .... Maintenance / employment pin center,large
- 2 .... The 1st program download processing section
- 3 .... Call connection section
- 4 .... Announcement equipment
- 5 .... Wireless exchange
- 6 .... Control signal line
- 7 .... Base transceiver station
- 8 .... The 2nd program download processing section
- 9 .... The 3rd program download processing section
- 10 13 .... Storage section
- 11 .... Migration terminal
- 12 .... The 4th program download processing section
- 14 .... ROM
- 15 .... Radio channel
- 16 .... Center equipment
- 17 .... Terminal unit
- 18 .... Communication line
- 19 .... Communication interface
- 20 .... CPU
- 21 .... Memory
- 22 .... Memory card

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[Translation done.]



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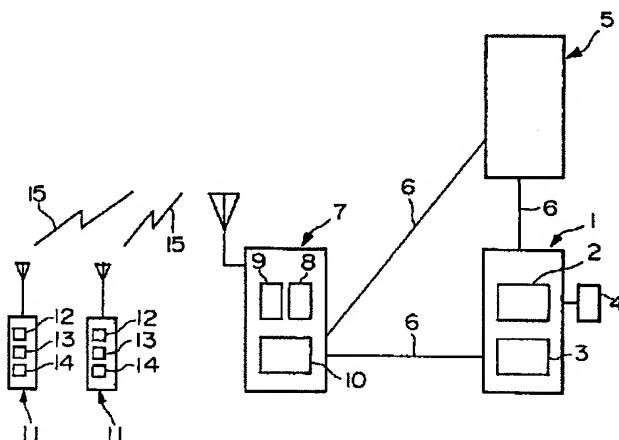
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## (54)【発明の名称】 移動端末へのプログラムダウンロード方法

## (57)【要約】

【課題】 移動端末のプログラム変更を行う場合、移動端末を回収し、移動端末のROMを交換するか、外部端子を用いてプログラムの変更を行っていた。移動端末を回収することなくプログラムを変更することが課題である。

【解決手段】 保守・運用センター1から移動端末11にダウンロードするプログラムを、無線基地局7にダウンロードし、記憶部10に書き込む。保守・運用センター1は、移動端末11を呼び出し、アナウンス装置4へ接続し、呼接続状態とし、無線基地局7へ移動端末11へのプログラムダウンロード開始要求を送信する。無線基地局7は呼接続で使用されている無線チャネル15を使用し、記憶装置10に書き込まれたプログラムを移動端末11へダウンロードする。移動端末11は、ダウンロードされたプログラムをROM14に書き込む。



**【特許請求の範囲】**

【請求項 1】 移動端末のプログラムの変更が必要になると、無線交換局に対して、該移動端末に対する呼接続要求を行い、呼接続が完了すると、該呼接続で使用している無線チャネルを使用して、前記移動端末へプログラムをダウンロードすることを特徴とする移動端末へのプログラムダウンロード方法。

【請求項 2】 複数の移動端末と無線チャネルにより通信する無線基地局を有し、前記無線基地局と回線により接続された無線交換局と保守・運用センターを有し、前記無線交換局と前記保守・運用センターも回線で接続され、

前記保守・運用センターは、移動端末のプログラムを前記無線基地局へ回線を介して送信し、前記無線交換局と前記無線基地局を介し前記移動端末を呼び出し、前記無線基地局から前記移動端末へ、該移動端末のプログラムを転送し、該移動端末のプログラムを変更することを特徴とする移動端末へのプログラムダウンロード方法。

【請求項 3】 複数の移動端末と無線チャネルにより通信する無線基地局を有し、前記無線基地局と回線により接続された無線交換局と保守・運用センターを有し、前記無線交換局と前記保守・運用センターも回線で接続され、

前記保守・運用センターは、移動端末のプログラムを前記無線基地局へ回線を介して送信し、

前記無線交換局は、前記無線基地局を介し前記移動端末を呼び出し、

前記保守・運用センターは、前記無線基地局から前記移動端末へ、該移動端末のプログラムを転送し、該移動端末のプログラムを変更することを特徴とする移動端末へのプログラムダウンロード方法。

【請求項 4】 前記無線基地局は、保守・運用センターから前記移動端末のプログラムを受信し、記憶部に保持し、前記移動端末へ前記無線チャネルを介して該移動端末のプログラムを送信することを特徴とする請求項 2 または請求項 3 のいずれかに記載の移動端末へのプログラムダウンロード方法。

【請求項 5】 前記移動端末は、ROM 上に該移動端末のプログラムを有し、前記無線チャネルを介し前記無線基地局から該移動端末のプログラムを受信し、記憶部に保持し、前記保守・運用センターからの指示により、前記 ROM 上のプログラムを、前記記憶部に保持したプログラムに変更することを特徴とする請求項 2 ないし請求項 4 のいずれかに記載の移動端末へのプログラムダウンロード方法。

**【発明の詳細な説明】****【0001】**

【発明の属する技術分野】本発明は、移動端末へのプログラムダウンロード方法に関し、特に無線チャネルを使用した移動端末へのプログラムダウンロード方法に関す

る。

**【0002】**

【従来の技術】従来、この種のプログラムダウンロード方法としては、たとえば特開平 02-176954 号公報に示されるように、端末装置とセンタ装置が通信回線（有線）で接続され、その通信回線を通してプログラムをダウンロードする方法が用いられている。

【0003】図 7 は、従来のプログラムダウンロード方法の一例を示すブロック図である。この図において、センタ装置 16 は、一例として、中央の管理センターに設置されており、端末装置 17 は、一例として、地方の保守センターに設置されている。そして、センタ装置 16 と端末装置 17 は、通信回線 18（有線）で接続されている。端末装置 17 はメモリ 21 を備えた CPU 20 を含み、この CPU 20 は、通信インタフェース 19 を介してセンタ装置 16 と接続されている。また、CPU 20 は、メモリカード 22 からプログラムを読みとったり、書き込んだりする機能を有する。メモリ 21 は各種データ、プログラム等の記憶エリアを有する。メモリカード 22 には端末装置 17 のプログラムがプログラム版数とともに格納されている。センタ装置 16 には、常に端末装置 17 の最新のプログラムが設定されている。

【0004】端末装置 17 に電源が投入されると、CPU 20 はメモリーカード 22 からプログラムを読みだし、メモリ 21 に格納する。この読み出したプログラムの版数は端末装置 17 からセンタ装置 16 に伝送される。センタ装置 16 は、端末装置 17 から伝送されたプログラム版数と、該センタ装置 16 に記憶されている最新のプログラム版数とを比較し、一致するかどうか判定し、一致しなければ、通信回線 18 を介して、最新のプログラムを端末装置 17 へ伝送する。端末装置 17 では、伝送された最新のプログラムをメモリ 21 に格納し、メモリカード 22 に最新のプログラムを書き込んで良いかどうかを尋ねるメッセージを表示する。端末装置 17 の操作者がこの表示を見て許可の旨を入力すると、最新のプログラムをメモリーカード 22 へ書き込む。

【0005】上述した方法は、端末装置 17 へのプログラムダウンロード方法であるが、携帯電話等の移動端末へのプログラムダウンロードも、これと同様の方法で行われている。この場合、端末装置 17 が携帯電話（移動端末）に相当し、該移動端末は保守センターに持ち込まれ、該移動端末を通信回線 18 に接続することによって、プログラムが変更されていた。

**【0006】**

【発明が解決しようとする課題】第 1 の問題点は、従来の技術において、移動端末のプログラムを変更するには、移動端末を回収しプログラムの変更を行うことである。その理由は、移動端末のプログラムを変更するには、移動端末の ROM を交換するか、移動端末の外部端子を通信回線に接続して、移動端末のプログラムを変更

していたからである。

【0007】第2の問題点は、従来の技術において、移動端末のプログラムを変更するには、移動端末とプログラムダウンロード装置を有線で接続してプログラムを変更していたことと、この問題によりプログラムダウンロード装置（すなわち、センタ装置16と移動端末とを接続するための装置）を複数用意しなければならないことである。その理由は、移動端末の外部端子を用いて移動端末のプログラムを変更していたから、一度に複数の移動端末のプログラムを変更するには、複数のプログラムダウンロード装置を使用する必要があるからである。

【0008】本発明では、移動端末のプログラムを変更する際に、移動端末を回収せずに移動端末のプログラム変更を可能にすることと、移動端末の外部端子を使用せず移動端末のプログラム変更を可能にすることと、同時に複数の移動端末のプログラム変更を可能にすることを目的とする。

【0009】

【課題を解決するための手段】請求項1記載の発明は、移動端末のプログラムの変更が必要になると、無線交換局に対して、該移動端末に対する呼接続要求を行い、呼接続が完了すると、該呼接続で使用している無線チャネルを使用して、前記移動端末へプログラムをダウンロードすることを特徴とする。請求項2記載の発明は、複数の移動端末と無線チャネルにより通信する無線基地局を有し、前記無線基地局と回線により接続された無線交換局と保守・運用センターを有し、前記無線交換局と前記保守・運用センターも回線で接続され、前記保守・運用センターは、移動端末のプログラムを前記無線基地局へ回線を介して送信し、前記無線交換局と前記無線基地局を介し前記移動端末を呼び出し、前記無線基地局から前記移動端末へ、該移動端末のプログラムを転送し、該移動端末のプログラムを変更することを特徴とする。請求項3記載の発明は、複数の移動端末と無線チャネルにより通信する無線基地局を有し、前記無線基地局と回線により接続された無線交換局と保守・運用センターを有し、前記無線交換局と前記保守・運用センターも回線で接続され、前記保守・運用センターは、移動端末のプログラムを前記無線基地局へ回線を介して送信し、前記無線交換局は、前記無線基地局を介し前記移動端末を呼び出し、前記保守・運用センターは、前記無線基地局から前記移動端末へ、該移動端末のプログラムを転送し、該移動端末のプログラムを変更することを特徴とする。請求項4記載の発明は、前記無線基地局は、保守・運用センターから前記移動端末のプログラムを受信し、記憶部に保持し、前記移動端末へ前記無線チャネルを介して該移動端末のプログラムを送信することを特徴とする。請求項5記載の発明は、前記移動端末は、ROM上に該移動端末のプログラムを有し、前記無線チャネルを介し前記無線基地局から該移動端末のプログラムを受信し、記

憶部に保持し、前記保守・運用センターからの指示により、前記ROM上のプログラムを、前記記憶部に保持したプログラムに変更することを特徴とする。

【0010】

【発明の実施の形態】

§1. 作用

移動端末のプログラムは保守・運用センターにのみ設定される。前記保守・運用センターより無線基地局へ前記移動端末のプログラムを送信し、無線基地局の記憶部に保持する。前記保守・運用センターはプログラムを変更する移動端末を、無線交換局及び前記無線基地局を介して呼び出し、前記無線基地局から前記移動端末へプログラムダウンロードを行うことにより、移動端末のプログラムの変更を行う。

【0011】§2. 第1実施形態

次に、本発明の実施の形態について図面を参照して詳細に説明する。図1を参照すると、本発明の第1の実施の形態は、保守・運用センター1と、無線交換局5と、無線基地局7と、移動端末11を含む。保守・運用センター1と無線交換局5と無線基地局7は、それぞれ制御信号線6で接続されており、無線基地局7と移動端末11は、無線チャネル15を使用して通信が行われる。保守・運用センター1は、第1のプログラムダウンロード処理部2と、呼接続部3と、アナウンス装置4とを備えている。無線基地局7は、第2のプログラムダウンロード処理部8と、第3のプログラムダウンロード処理部9と、記憶部10とを備えている。移動端末11は、第4のプログラムダウンロード処理部12と、記憶部13と、ROM14とを備えている。

【0012】なお、第1のプログラムダウンロード処理部2、第2のプログラムダウンロード処理部8、第3のプログラムダウンロード処理部9、第4のプログラムダウンロード処理部12は、一例として、いずれもCPU（中央処理装置）を中心とした処理回路であり、図2～図5に示すフローチャートに基づいて動作する。また、記憶部10および記憶部13は、一例として、いずれもRAMが用いられる。

【0013】保守・運用センター1は、移動端末11へのプログラムダウンロード要求があると、第1のプログラムダウンロード処理部2と、無線基地局7の第2のプログラムダウンロード処理部8により、保守・運用センター1と無線基地局7間の制御信号線6を使用し、無線基地局7の記憶部10にプログラムを書き込む。次に、保守・運用センター1は、呼接続部3により、プログラムをダウンロードする移動端末11を呼び出し、アナウンス装置4に接続し、第1のプログラムダウンロード処理部2と、無線基地局7の第3のプログラムダウンロード処理部9と、移動端末11の第4のプログラムダウンロード処理部12により、無線基地局7と移動端末11間で、呼接続で使用されている無線チャネル15を使用

し、無線基地局7の記憶部10に書き込まれたプログラムを、移動端末11の記憶部13に書き込み、記憶部13に正常に書き込まれたならば、該プログラムを移動端末11のROM14に書き込む。保守・運用センター1は、移動端末11へのプログラムダウンロードが終了すると、呼接続部3でアナウンス装置4に接続された呼を解放する。

【0014】次に、本発明の実施の形態の動作について、図1、図2、図3、図4及び図5を参照して詳細に説明する。

【0015】(1)第1のプログラムダウンロード処理部2の動作

保守・運用センター1において、移動端末11へのプログラムダウンロード要求が入力されると、第1のプログラムダウンロード処理部2は以下の処理を行う。図1及び図2を参照すると、第1のプログラムダウンロード処理部2は、移動端末11へのプログラムダウンロード要求を受け付けると(ステップ101)、移動端末11にダウンロードするプログラムの版数を読みだし(ステップ102)、無線基地局7へプログラムダウンロード開始要求(ステップ103)し、ダウンロードするプログラム版数を送信する。

【0016】次に、第1のプログラムダウンロード処理部2は、無線基地局7から応答信号を受信すると(ステップ104)、該応答信号に基づいて、無線基地局7へのプログラムダウンロードが必要か判断し(ステップ105)、必要であれば(ステップ106)、無線基地局7へプログラムをダウンロードし(ステップ107)、必要で無ければ(ステップ109)、呼接続部3で移動端末11を呼び出す(ステップ112)。

【0017】次に、第1のプログラムダウンロード処理部2は、無線基地局7よりプログラムのダウンロード結果を受信すると(ステップ108)、該ダウンロード結果に基づいて、正常にダウンロードできたか判断し(ステップ110)、正常にダウンロードできたなら(ステップ111)、呼接続部3で移動端末11を呼び出し(ステップ112)、正常にダウンロードできなかったなら(ステップ113)、処理を終了する(ステップ121)。

【0018】次に、第1のプログラムダウンロード処理部2は、移動端末11から応答があるか判断し(ステップ114)、応答があったなら(ステップ115)、プログラムダウンロード用のアナウンス装置4に接続し(ステップ116)、無線基地局7に対して、移動端末11へのプログラムダウンロード開始要求を送信する(ステップ117)。次に、第1のプログラムダウンロード処理部2は、無線基地局7よりダウンロード結果を受信すると(ステップ119)、呼解放し(ステップ120)、処理を終了する(ステップ121)。

【0019】(2)第2のプログラムダウンロード処理

部8の動作

無線基地局7において、保守・運用センター1からプログラムダウンロード開始要求を受信すると、第2のプログラムダウンロード処理部8は以下の処理を行う。

【0020】図1及び図3を参照すると、第2のプログラムダウンロード処理部8は、プログラムダウンロード開始要求を受信すると(ステップ201)、記憶部10よりプログラム版数を読みだし(ステップ202)、プログラムダウンロード開始要求で受信したプログラム版数と比較し(ステップ203)、プログラム版数が不一致であれば(ステップ204)、保守・運用センター1へ応答信号を送信しダウンロードが必要であることを通知し(ステップ205)、プログラム版数が一致したなら(ステップ207)、保守・運用センター1へ応答信号を送信しダウンロードは不要であることを通知し(ステップ208)、処理を終了する(ステップ215)。

【0021】次に、第2のプログラムダウンロード処理部8は、保守・運用センター1よりプログラムがダウンロードされると(ステップ206)、正常にダウンロードされたか判断し(ステップ209)、正常であれば(ステップ210)、記憶部10へダウンロードされたプログラムを書き込み(ステップ211)、保守・運用センター1にダウンロード結果が正常であることを通知し(ステップ212)、処理を終了する(ステップ215)。正常にダウンロードされなければ(ステップ213)、保守・運用センター1にダウンロード結果が異常であったことを通知し(ステップ214)、処理を終了する(ステップ215)。

【0022】(3)第3のプログラムダウンロード処理部9の動作

無線基地局7において、保守・運用センター1から移動端末11へのプログラムダウンロード開始要求を受信すると、第3のプログラムダウンロード処理部9は以下の処理を行う。

【0023】図1及び図4を参照すると、第3のプログラムダウンロード処理部9は、移動端末11へのプログラムダウンロード開始要求を受信すると(ステップ301)、移動端末11が呼接続されているか確認し(ステップ302)、呼接続されていれば(ステップ303)、記憶部10よりプログラム版数を読みだし(ステップ304)、呼接続で使用されている無線チャネル15にて移動端末11へプログラムダウンロード開始要求を送信し(ステップ305)、プログラム版数を通知する。移動端末11が呼接続されていなければ(ステップ307)、保守・運用センター1へ応答信号でダウンロード結果が異常であったことを通知し(ステップ309)、処理を終了する(ステップ320)。

【0024】次に、第3のプログラムダウンロード処理部9は、移動端末11より応答信号を受信すると(ステップ306)、応答信号からプログラムダウンロードが

必要か判断し（ステップ308）、必要であれば（ステップ309）、記憶部10に書き込まれているプログラムを、呼接続で使用されている無線チャネル15にて移動端末11へダウンロードし（ステップ310）、必要でなければ（ステップ312）、保守・運用センター1へ応答信号でダウンロード結果が異常であったことを通知し（ステップ319）、処理終了する（ステップ320）。

【0025】次に、第3のプログラムダウンロード処理部9は、移動端末11よりダウンロード結果を受信すると（ステップ311）、ダウンロード結果より正常にダウンロードされたか判断し（ステップ313）、正常にダウンロードされたなら（ステップ314）、呼接続で使用されている無線チャネル15で、移動端末11に対して、ROM14へのプログラム書き込み指示を送信し（ステップ316）、正常にダウンロードされなかったなら（ステップ315）、保守・運用センター1へ応答信号でダウンロード結果が異常であったことを通知し（ステップ319）、処理終了する（ステップ320）。

【0026】次に、第3のプログラムダウンロード処理部9は、移動端末11より、ROM14への書き込み完了通知を受信すると（ステップ317）、保守・運用センター1へ応答信号でダウンロード結果が正常であったことを通知し（ステップ318）、処理終了する（ステップ320）。

【0027】（4）第4のプログラムダウンロード処理部12の動作

移動端末11において、無線基地局7からプログラムダウンロード開始要求を受信すると、第4のプログラムダウンロード処理部12は以下の処理を行う。

【0028】図1及び図5を参照すると、第4のプログラムダウンロード処理部12は、プログラムダウンロード開始要求を受信すると（ステップ401）、ROM14に書かれているプログラム版数を読みだし（ステップ402）、プログラムダウンロード開始要求で受信したプログラム版数と比較し（ステップ403）、プログラム版数が不一致であれば（ステップ404）、無線基地局7へ応答信号を送信しダウンロードが必要であることを通知し（ステップ405）、プログラムが一致したなら（ステップ407）、無線基地局7へ応答信号を送信しダウンロードは不要であることを通知し（ステップ408）、処理を終了する（ステップ417）。

【0029】次に、第4のプログラムダウンロード処理部12は、無線基地局7よりプログラムがダウンロードされると（ステップ406）、正常にダウンロードされたか判断し（ステップ409）、正常であれば（ステップ410）、記憶部13へダウンロードされたプログラムを書き込み（ステップ411）、無線基地局7へダウンロード結果が正常であることを通知し（ステップ41

2）、正常でなければ（ステップ416）、無線基地局7へダウンロード結果が異常であったことを通知し（ステップ417）、処理を終了する（ステップ418）。

【0030】次に、第4のプログラムダウンロード処理部12は、無線基地局7よりROM14へのプログラム書き込み指示を受信すると（ステップ413）、記憶部13に書き込まれたプログラムをROM14へ書き込み（ステップ414）、無線基地局7に対して、ROM14への書き込み完了通知を送信し（ステップ415）、処理を終了する。

【0031】次に、本発明の実施例について図面を参照して説明する。図1を参照すると、本発明の実施例では、たとえば移動端末11のROM14と無線基地局7の記憶部10に記憶されているプログラム版数を*i*版とし、保守・運用センター1からプログラムダウンロードされるプログラム版数を*j*版とする。保守・運用センター1で移動端末11へのプログラムダウンロード要求が入力されると、第1のプログラムダウンロード処理部2から無線基地局7の第2のプログラムダウンロード処理部8へ、プログラムダウンロード開始要求が送信され、プログラム版数=*j*版が通知される。第2のプログラムダウンロード処理部8は、記憶部10に記憶しているプログラム版数=*i*版と版数が不一致であるので、ダウンロードが必要であると判断し、第1のプログラムダウンロード処理部2と第2のプログラムダウンロード処理部8とで、無線基地局7へプログラム版数=*j*版のプログラムをダウンロードし、記憶部10へ書き込む。

【0032】次に、第1のプログラムダウンロード処理部2は、呼接続部3で移動端末11を呼び出し、アナウンス装置4へ接続し、移動端末11を呼接続状態にする。呼接続は呼接続部3から無線交換局5に要求され、無線交換局5と無線基地局7と移動端末11とで呼接続処理が行われ、無線基地局7と移動端末11間は無線チャネル15で接続される。第1のプログラムダウンロード処理部2は、移動端末11が呼接続状態になると、無線基地局7の第3のプログラムダウンロード処理部9へ、移動端末11へのプログラムダウンロード開始要求を送信する。第3のプログラムダウンロード処理部9は、移動端末11の第4のプログラムダウンロード処理部12へ、呼接続で使用されている無線チャネル15を使用し、プログラムダウンロード開始要求を送信し、記憶部10に書き込まれたプログラム版数=*j*版を通知する。第4のプログラムダウンロード処理部12は、ROMに記憶されているプログラム版数=*i*版と版数が不一致であるので、ダウンロードが必要であると判断し、第3のプログラムダウンロード処理部9と第4のプログラムダウンロード処理部12とで、移動端末11へプログラム版数=*j*版のプログラムをダウンロードし、ROM14へ書き込む。ROM14への書き込みが完了すると、第1のプログラムダウンロード処理部2は、移動端

末11と接続されている呼を解放する。

【0033】次に、本発明の実施例の動作について、図1、図2、図3、図4及び図5を参照して詳細に説明する。

(a) 第1のプログラムダウンロード処理部2の動作  
保守・運用センター1において、移動端末11へのプログラムダウンロード要求が入力されると、第1のプログラムダウンロード処理部2は以下の処理を行う。

【0034】図1及び図2を参照すると、第1のプログラムダウンロード処理部2は、移動端末11へのプログラムダウンロード要求を受け付けると(ステップ101)、移動端末11にダウンロードするプログラム版数=j版を読みだし(ステップ102)、無線基地局7へプログラムダウンロード開始要求(ステップ103)し、ダウンロードするプログラム版数=j版を送信する。

【0035】第1のプログラムダウンロード処理部2は、無線基地局7から応答信号を受信すると(ステップ104)、応答信号から無線基地局7へのプログラムダウンロードは必要と判断され(ステップ105、106)、無線基地局7へプログラムをダウンロードする(ステップ107)。次に、第1のプログラムダウンロード処理部2は、無線基地局7よりプログラムのダウンロード結果を受信すると(ステップ108)、該ダウンロード結果に基づいて、正常にダウンロードできたと判断されたなら(ステップ110、111)、呼接続部3で移動端末11を呼び出す(ステップ115)。

【0036】次に、第1のプログラムダウンロード処理部2は、移動端末11から応答があったなら(ステップ114、115)、プログラムダウンロード用のアナウンス装置4に接続し(ステップ116)、無線基地局7へ移動端末11へのプログラムダウンロード開始要求を送信する(ステップ116)。次に、第1のプログラムダウンロード処理部2は、無線基地局7よりプログラムダウンロード完了通知を受信すると(ステップ117)、呼解放し(ステップ118)、処理を終了する(ステップ119)。

【0037】(b) 第2のプログラムダウンロード処理部8の動作

無線基地局7において、保守・運用センター1からプログラムダウンロード開始要求を受信すると、第2のプログラムダウンロード処理部8は以下の処理を行う。

【0038】図1及び図3を参照すると、第2のプログラムダウンロード処理部8は、プログラムダウンロード開始要求を受信すると(ステップ201)、記憶部10よりプログラム版数=i版を読みだし(ステップ202)、プログラムダウンロード開始要求で受信したプログラム版数=j版と不一致であるので(ステップ202、203)、保守・運用センター1へ応答信号を送信しダウンロードが必要であることを通知する(ステップ

205)。

【0039】次に、第2のダウンロード処理部8は、保守・運用センター1よりプログラムがダウンロードされると(ステップ206)、正常にダウンロードされたなら(ステップ209、210)、記憶部10へダウンロードされたプログラム版数=j版のプログラムを書き込み(ステップ211)、保守・運用センター1へ正常にダウンロードされたことを通知し(ステップ212)、処理を終了する(ステップ215)。

【0040】(c) 第3のプログラムダウンロード処理部9の動作

無線基地局7において、保守・運用センター1から移動端末11へのプログラムダウンロード開始要求を受信すると、第3のプログラムダウンロード処理部9は以下の処理を行う。

【0041】図1及び図4を参照すると、第3のプログラムダウンロード処理部9は、移動端末11へのプログラムダウンロード開始要求を受信すると(ステップ301)、移動端末11は呼接続されているので(ステップ302、303)、記憶部10よりプログラム版数=j版を読みだし(ステップ304)、呼接続で使用されている無線チャネル15にて、移動端末11へプログラムダウンロード開始要求を送信し(ステップ305)、プログラム版数=j版を通知する。

【0042】次に、第3のプログラムダウンロード処理部9は、移動端末11から応答信号を受信すると(ステップ306)、該応答信号に基づいて、プログラムダウンロードが必要であると判断し(ステップ308、309)、記憶部10に書き込まれているプログラムを、呼接続で使用されている無線チャネル15にて移動端末11へダウンロードする(ステップ310)。

【0043】次に、第3のプログラムダウンロード処理部9は、移動端末11よりダウンロード結果を受信すると(ステップ311)、ダウンロード結果より正常にダウンロードされたなら(ステップ313、314)、呼接続で使用されている無線チャネル15にて、移動端末11に対して、ROM14へのプログラム書き込み指示を送信する(ステップ316)。

【0044】次に、第3のプログラムダウンロード処理部9は、移動端末11より、ROM14への書き込み完了通知を受信すると(ステップ317)、保守・運用センター1へ応答信号でプログラムダウンロード完了を通知し(ステップ318)、処理を終了する(ステップ319)。

【0045】(d) 第4のプログラムダウンロード処理部12の動作

移動端末11において、無線基地局7からプログラムダウンロード開始要求を受信すると、第4のプログラムダウンロード処理部12は以下の処理を行う。

【0046】図1及び図5を参照すると、第4のプログ

ラムダウンロード処理部12は、プログラムダウンロード開始要求を受信すると(ステップ401)、ROM14に書かれているプログラム版数=i版を読みだし(ステップ402)、プログラムダウンロード開始要求で受信したプログラム版数=j版とプログラム版数が不一致であるので(ステップ403、404)、無線基地局7へプログラムダウンロードが必要であることを通知する(ステップ405)。

【0047】次に、第4のプログラムダウンロード処理部12は、無線基地局7よりプログラムがダウンロードされると(ステップ406)、正常にダウンロードされたなら(ステップ409、410)、ダウンロードされたプログラム版数=j版のプログラムを記憶部13へ書き込み(ステップ411)、無線基地局7へダウンロードが正常であったことを通知する(ステップ412)。

【0048】次に、第4のプログラムダウンロード処理部12は、無線基地局7よりROM14へのプログラム書き込み指示を受信すると(ステップ413)、記憶部13に書き込まれたプログラム版数=j版のプログラムをROM14へ書き込み(ステップ414)、無線基地局7へ書き込み完了通知を送信し(ステップ415)、処理を終了する(ステップ415)。

#### 【0049】§3. 第2実施形態

次に、本発明の第2の実施の形態について図面を参照して説明する。図6を参照すると、本発明の第2の実施の形態は、保守・運用センター1と、無線交換局5と、無線基地局7と、移動端末11とを含む。保守・運用センター1と無線交換局5と無線基地局7は、それぞれ制御信号線6で接続されており、無線基地局7と移動端末11は、無線チャネル15を使用して通信が行われる。保守・運用センター1は、第1のプログラムダウンロード処理部2を備えている。無線交換局5は、呼接続部3とアナウンス装置4とを備えている。無線基地局7は、第2のプログラムダウンロード処理部8と、第3のプログラムダウンロード処理部9と、記憶部10とを備えている。移動端末11は、第4のプログラムダウンロード処理部12と、記憶部13と、ROM14とを備えている。

【0050】保守・運用センター1は、移動端末11へのプログラムダウンロード要求があると、第1のプログラムダウンロード処理部2と、無線基地局7の第2のプログラムダウンロード処理部8により、保守・運用センター1と無線基地局7間の制御信号線6を使用し、無線基地局7の記憶部10にプログラムを書き込む。保守・運用センター1は、無線交換局5の呼接続部3に、プログラムをダウンロードする移動端末11の呼接続要求を行う。無線交換局5は、呼接続部3で移動端末11を呼び出し、アナウンス装置4に接続する。

【0051】保守・運用センター1は、移動端末11が呼接続されたならば、第1のプログラムダウンロード処

理部2と、無線基地局7の第3のプログラムダウンロード処理部9と、移動端末11の第4のプログラムダウンロード処理部12により、無線基地局7と移動端末11間で呼接続で使用されている無線チャネル15を使用し、無線基地局7の記憶部10に書き込まれたプログラムを、移動端末11の記憶部13に書き込み、記憶部13に正常に書き込まれたならば、該プログラムを移動端末11のROM14に書き込む。保守・運用センター1は、移動端末11へのプログラムダウンロードが終了すると、無線交換局5に呼解放を要求する。無線交換局5は、呼接続部3でアナウンス装置4に接続された呼を解放する。

【0052】次に、本発明の第2の実施の形態の動作を図面を参照して詳細に説明する。図2のステップ101~111、113、116、117、119と、図3と、図4及び図5の動作は、第1の実施の形態と同一のため、説明は省略する。図2の移動端末11の呼接続(ステップ112)は、無線交換局5の呼接続部3に要求される。無線交換局5では、呼接続部3で移動端末11を呼び出し、移動端末11から応答があればプログラムダウンロード用のアナウンス装置4へ接続し、保守・運用センター1へ呼接続されたことを通知し、応答がなければ、呼接続できなかったことを通知する。保守・運用センター1では、呼接続されれば、無線基地局7へ、移動端末11へのプログラムダウンロード開始要求を送信し(ステップ116)、呼接続されなければ、処理を終了する(ステップ119)。

【0053】次に実施例について説明する。図6の第1のプログラムダウンロード処理部2が、無線交換局5へ、移動端末11の呼接続要求を送信すると、無線交換局5は、呼接続部3で移動端末11を呼び出し、アナウンス装置4へ接続し、移動端末11を呼接続状態にし、保守・運用センター1へ呼接続結果を通知する。

【0054】以上、この発明の実施形態を図面を参照して詳述してきたが、具体的な構成はこの実施形態に限られるものではなく、この発明の要旨を逸脱しない範囲の設計の変更等があってもこの発明に含まれる。

#### 【0055】

【発明の効果】第1の効果は、移動端末のプログラムの変更を行う場合、保守・運用センターからプログラムをダウンロードすることにより、変更できるということである。これにより、移動端末を回収せずにプログラムの変更ができるようになる。その理由は、呼接続で使用している無線チャネルを使用して、移動端末へプログラムをダウンロードすることにより、プログラムの変更ができるからである。

【0056】第2の効果は、移動端末のプログラムの変更を行う場合、一度に複数の移動端末にプログラムをダウンロードし、変更できるということである。これにより、移動端末のプログラムを変更する作業時間が短縮で

きるようになる。その理由は、呼接続で使用している無線チャネルを使用して、移動端末へプログラムをダウンロードすることにより、プログラムの変更が行えるので、一度に複数の移動端末を呼び出しプログラムのダウンロードができるからである。

【図面の簡単な説明】

【図1】 本発明の第1の実施の形態を示すブロック図である。

【図2】 図1の第1のプログラムダウンロード処理部2の動作を説明する為のフローチャートである。

【図3】 図1の第2のプログラムダウンロード処理部8の動作を説明する為のフローチャートである。

【図4】 図1の第3のプログラムダウンロード処理部9の動作を説明する為のフローチャートである。

【図5】 図1の第4のプログラムダウンロード処理部12の動作を説明する為のフローチャートである。

【図6】 本発明の第2の実施の形態を示すブロック図である。

【図7】 従来例を示すブロック図である。

【符号の説明】

1 ……保守・運用センター

2 ……第1のプログラムダウンロード処理部

3 ……呼接続部

4 ……アナウンス装置

5 ……無線交換局

6 ……制御信号線

7 ……無線基地局

8 ……第2のプログラムダウンロード処理部

9 ……第3のプログラムダウンロード処理部

10, 13 ……記憶部

11 ……移動端末

12 ……第4のプログラムダウンロード処理部

14 ……ROM

15 ……無線チャネル

16 ……センタ装置

17 ……端末装置

18 ……通信回線

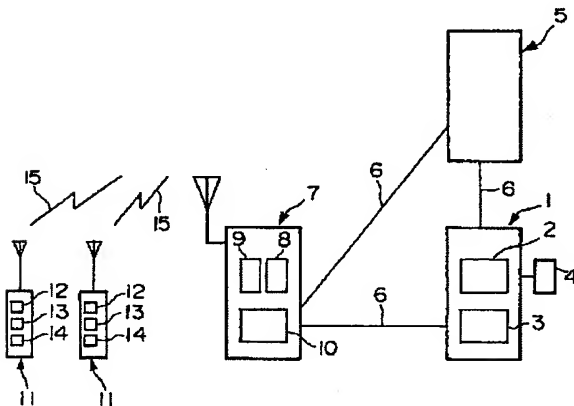
19 ……通信インタフェース

20 ……CPU

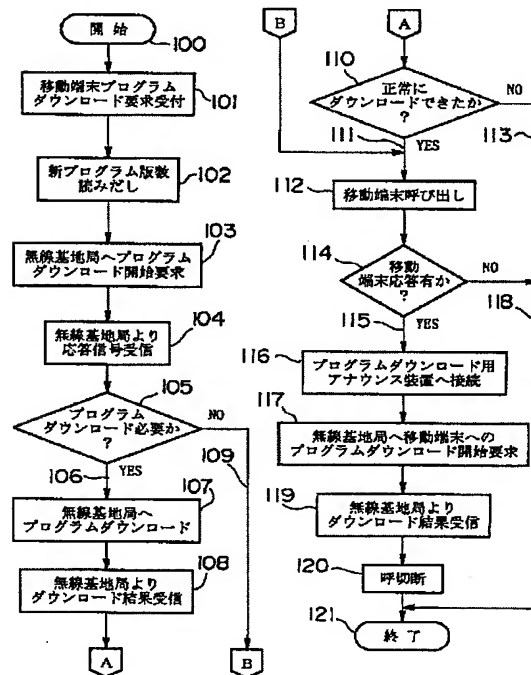
21 ……メモリ

22 ……メモリカード

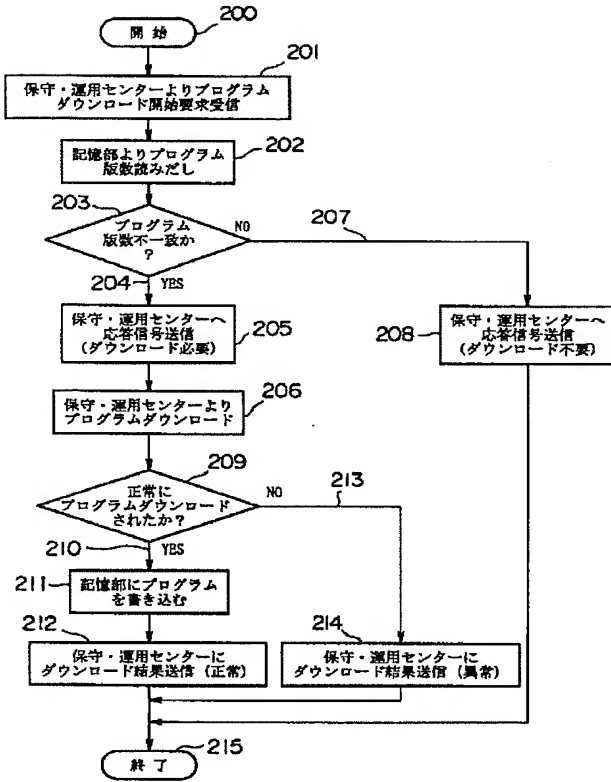
【図1】



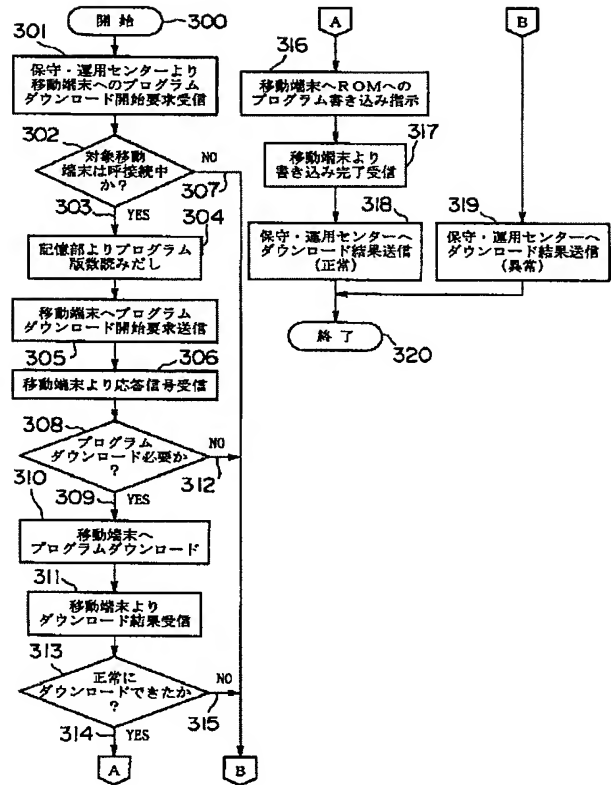
【図2】



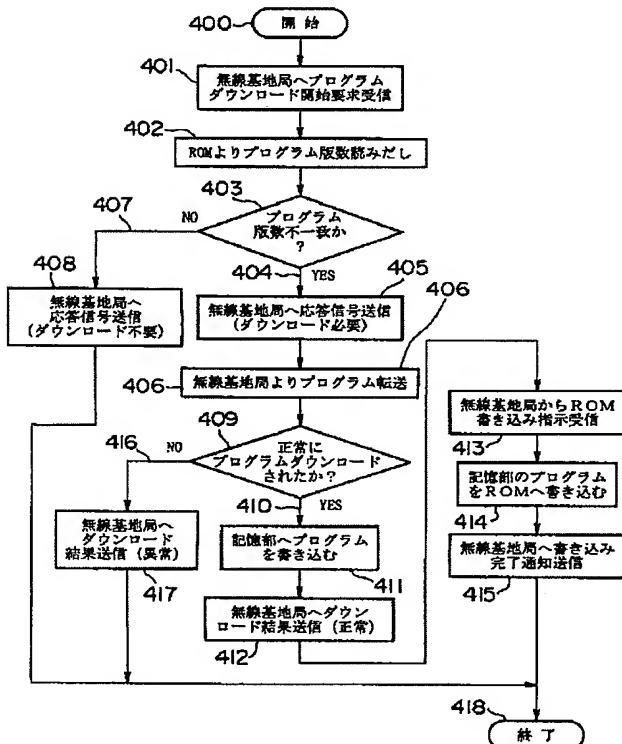
【図3】



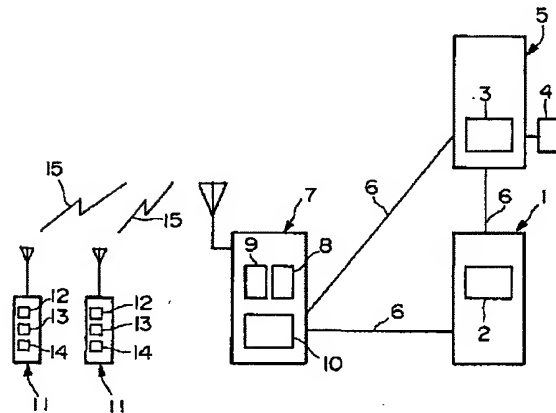
【図4】



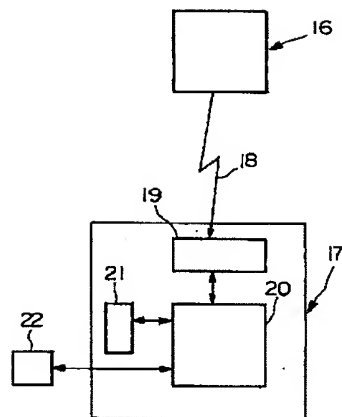
【図5】



【図6】



【図 7】



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